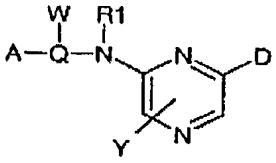
CLAIMS

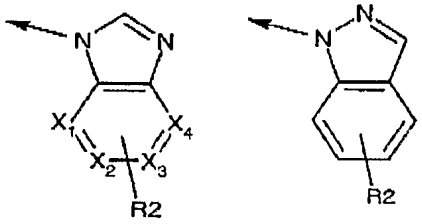
1. A compound of the general formula (I)



I

or pharmaceutically acceptable prodrugs, salts, hydrates, solvates, crystal forms or diastereomers thereof, wherein:

D is a heterocyclic ring selected from:



where X_1, X_2, X_3, X_4 are optionally substituted carbon, or one of X_1, X_2, X_3, X_4 is nitrogen and the rest optionally substituted carbon;

R2 is 0-3 substituents independently chosen from H, halogen, C_{1-4} alkyl, CF_3, OCF_3, $OCHF_2$, CN, aryl, hetaryl, C_{1-4} alkylOH, C_{1-4}alkylNR3R4, C_{1-4}alkylhetaryl, OC_{1-4} alkyl, OC_{1-4}alkylNR3R4, OC_{1-4}alkylhetaryl, OC_{1-4} alkylOH, CO_2R3, CONR3R4, NR3R4, nitro, NR3COR4, NR5CONR3R4, $NR3SO_2R4$, C_{1-4}alkylNR3COR4, C_{1-4}alkylNR5CONR3R4, C_{1-4}alkylNR3SO_2R4;

R3, R4 are each independently H, C_{1-4} alkyl, C_{1-4}alkylOH, C_{1-4}alkylNR19R20, C_{1-4} alkyl cycloalkyl, C_{1-4} cyclohetalkyl, aryl, C_{1-4} alkylaryl, hetaryl, C_{1-4} alkylhetaryl, or may be joined to form an optionally substituted 3-8 membered (saturated or unsaturated) ring optionally containing an atom selected from O, S, NR6;

and R5 is selected from H, C_{1-4} alkyl, aryl or hetaryl;

R6 is selected from H, C_{1-4} alkyl, C_{1-4}alkylNR19R20, aryl, hetaryl, C_{1-4} alkyl aryl, C_{1-4} alkyl hetaryl;

R19, R20 are each independently selected from H, C_{1-4}alkyl;

R1 is H, C_{1-4} alkyl, C_{1-6} cycloalkyl, or may form a 5-8 membered ring onto the ortho position of ring A;

Q is a bond, CH_2, C_{1-4} alkyl;

A is aryl, hetaryl optionally substituted with 0-3 substituents independently chosen from halogen, C_{1-4} alkyl, CF_3, OCF_3, CN, NR8R9, aryl, hetaryl, C_{1-4}aryl, C_{1-4}hetaryl, C_{1-4} alkylNR8R9, OC_{1-4} alkylNR8R9, nitro, NR10C_{1-4}NR8R9, NR8COR9, NR10CONR8R9, $NR8SO_2R9$, CONR8R9, CO_2R8;

R8 and R9 are each independently H, C_{1-4} alkyl, aryl or together form an optionally substituted 4-8 membered ring which may contain a heteroatom selected from O, S, NR11;

R10 is selected from H, C_{1-4} alkyl;

R11 is selected from H, C_{1-4} alkyl;

W is selected from H, C_{1-4}alkyl, C_{2-6}alkenyl or may form a 5-8 membered ring onto the ortho position of ring A; where C_{1-4}alkyl or C_{2-6}alkenyl may be optionally substituted with C_{1-4}alkyl, OH, OC_{1-4}alkyl, NR12R13;

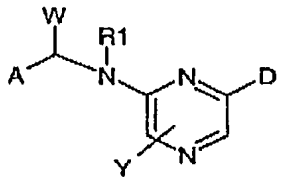
R12, and R13 are each independently H, C_{1-4}alkyl, or may be joined to form an optionally substituted 3-8 membered ring optionally containing an atom selected from O, S, NR14;

R14 is selected from H, C_{1-4} alkyl;

Y is 0-2 substituents selected from H, C_{1-4} alkyl, NR15R16;

R15 and R16 are independently selected from H, C_{1-4}alkyl.

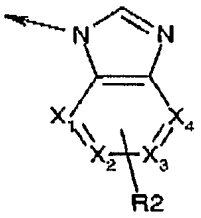
2. A compound according to formula (I) of claim 1, wherein the compound is selected from compounds of the general formula (II):



II

or pharmaceutically acceptable prodrugs, salts, hydrates, solvates, crystal forms or diastereomers thereof, wherein:

D is a heterocyclic ring selected from:



where X_1, X_2, X_3, X_4 are optionally substituted carbon, or one of X_1, X_2, X_3, X_4 is N and the rest optionally substituted carbon;

R2 is 0-3 substituents independently chosen from H, halogen, C_{1-4} alkyl, CF_3, OCF_3, $OCHF_2$, CN, aryl, hetaryl, C_{1-4} alkylOH, C_{1-4}alkylNR3R4, C_{1-4}alkylhetaryl, OC_{1-4} alkyl, OC_{1-4}alkylNR3R4, OC_{1-4}alkylhetaryl, OC_{1-4} alkylOH, CO_2R3, CONR3R4, NR3R4, nitro, NR3COR4, NR5CONR3R4, $NR3SO_2R4$, C_{1-4}alkylNR3COR4, C_{1-4}alkylNR5CONR3R4, C_{1-4}alkylNR3SO_2R4;

R3, R4 are each independently H, C_{1-4} alkyl, C_{1-4}alkylOH, C_{1-4}alkylNR19R20, C_{1-4} alkyl cycloalkyl, C_{1-4} cyclohetalkyl, aryl, C_{1-4} alkylaryl, hetaryl, C_{1-4} alkylhetaryl, or may be joined to form an optionally substituted 3-8 membered (saturated or unsaturated) ring optionally containing an atom selected from O, S, NR6;

and R5 is selected from H, C_{1-4} alkyl, aryl or hetaryl;

R6 is selected from H, C_{1-4} alkyl, C_{1-4}alkylNR19R20, aryl, hetaryl, C_{1-4} alkyl aryl, C_{1-4} alkyl hetaryl;

R19, R20 are each independently selected from H, C_{1-4}alkyl;

R1 is H, C_{1-4} alkyl, C_{1-6} cycloalkyl, or may form a 5-8 membered ring onto the ortho position of ring A;

A is aryl, hetaryl optionally substituted with 0-3 substituents independently chosen from halogen, C_{1-4} alkyl, CF_3, OCF_3, CN, NR8R9, aryl, hetaryl, C_{1-4}aryl, C_{1-4}hetaryl, C_{1-4} alkylNR8R9, OC_{1-4} alkylNR8R9, nitro, NR10C_{1-4}NR8R9, NR8COR9, NR10CONR8R9, NR8SO_2R9, CONR8R9, CO_2R8;

R8 and R9 are each independently H, C_{1-4} alkyl, aryl or together form an optionally substituted 4-8 membered ring which may contain a heteroatom selected from O, S, NR11;

R10 is selected from H, C_{1-4} alkyl;

R11 is selected from H, C_{1-4} alkyl;

W is selected from H, C_{1-4}alkyl, C_{2-6}alkenyl or may form a 5-8 membered ring onto the ortho position of ring A; where C_{1-4}alkyl or C_{2-6}alkenyl may be optionally substituted with C_{1-4}alkyl, OH, OC_{1-4}alkyl, NR12R13;

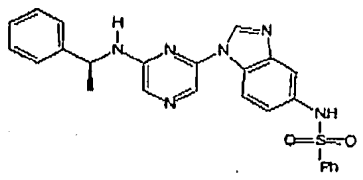
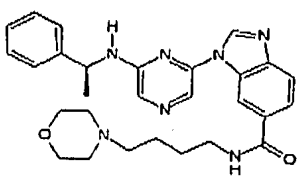
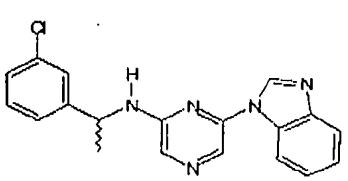
R12, and R13 are each independently H, C_{1-4}alkyl, or may be joined to form an optionally substituted 3-8 membered ring optionally containing an atom selected from O, S, NR14;

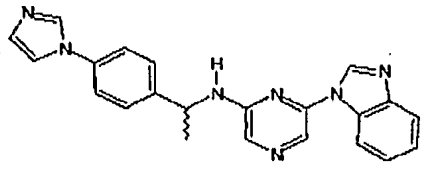
R14 is selected from H, C_{1-4} alkyl;

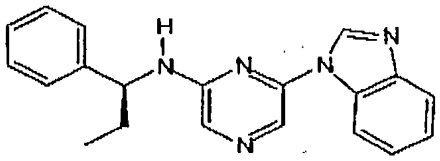
Y is 0-2 substituents selected from H, C_{1-4} alkyl, NR15R16;

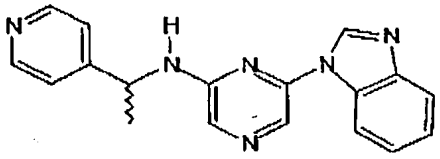
R15 and R16 are independently selected from H, C_{1-4}alkyl.

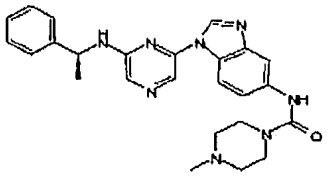
3. A compound according to formula (I) of claim 1 selected from the group consisting of:

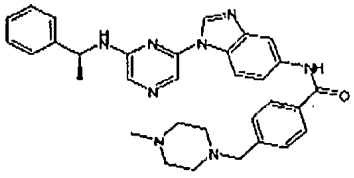




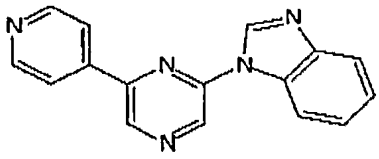


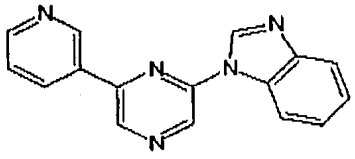


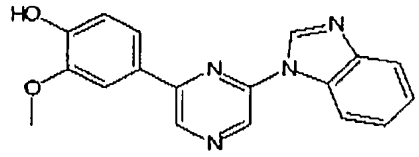


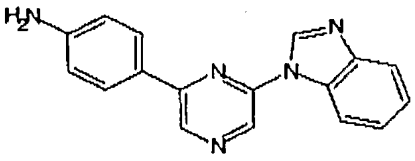


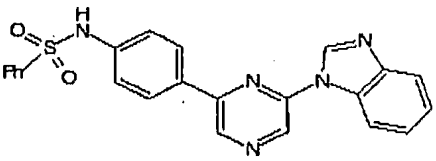


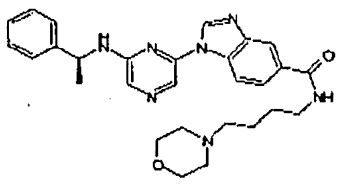


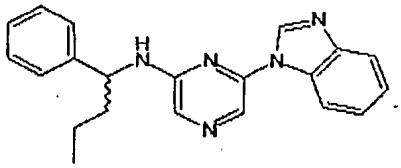


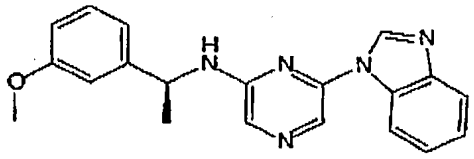


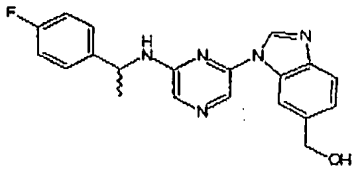


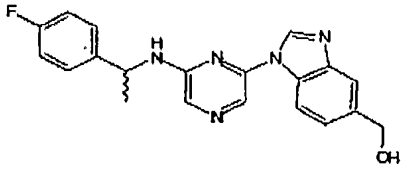


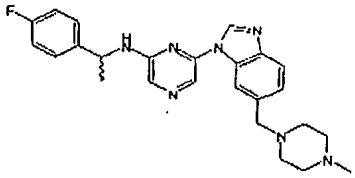


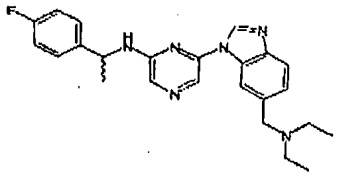


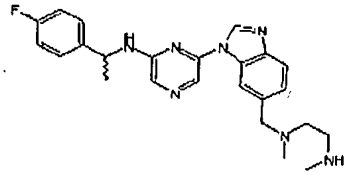


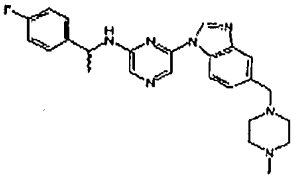


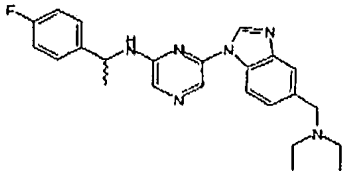


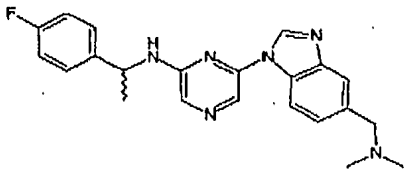


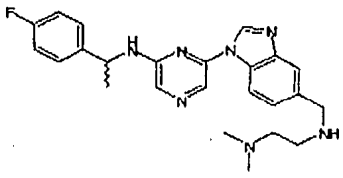


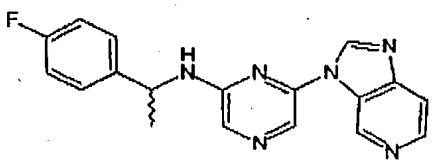


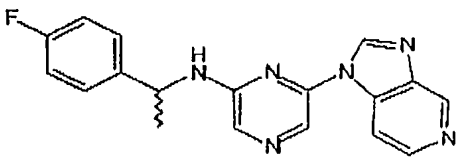


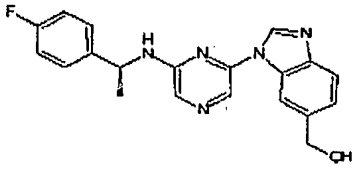


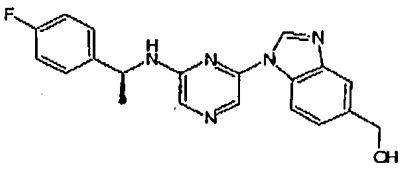


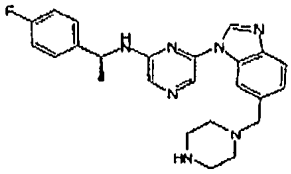


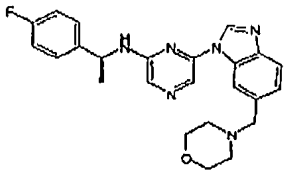


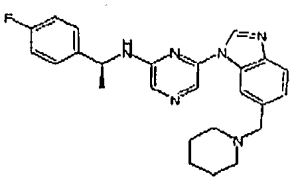


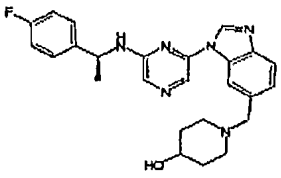


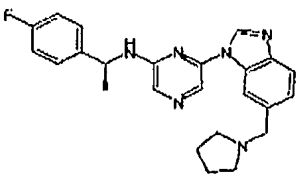


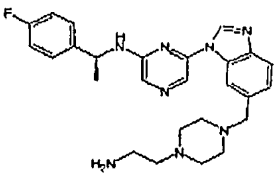


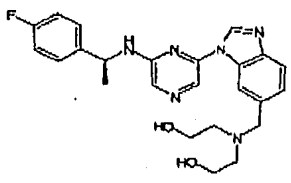


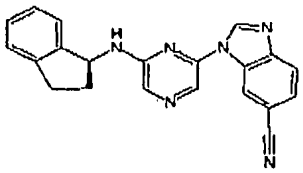


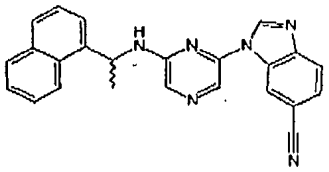


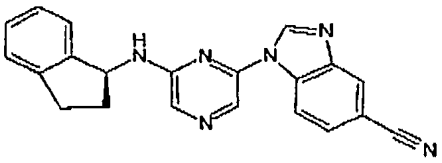


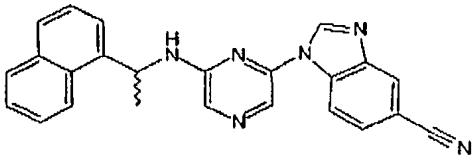


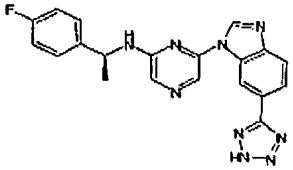


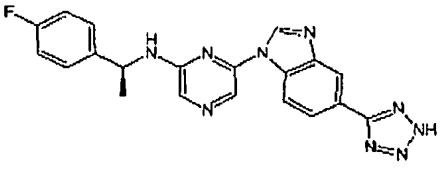


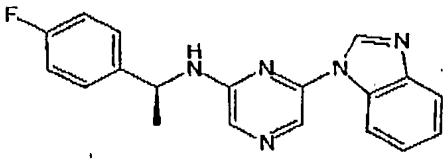


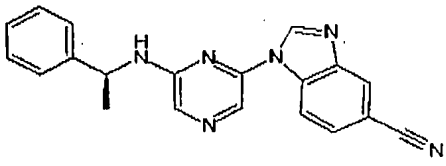


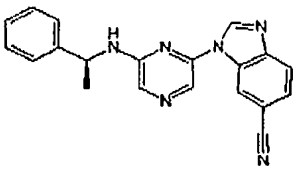


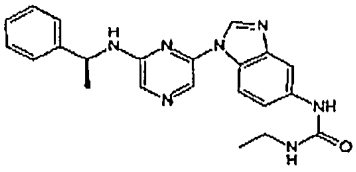


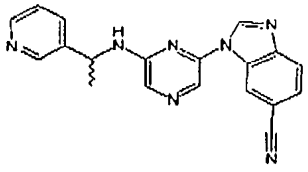


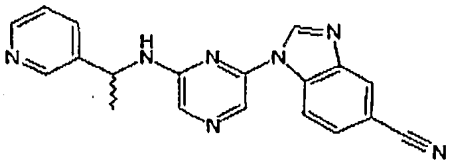


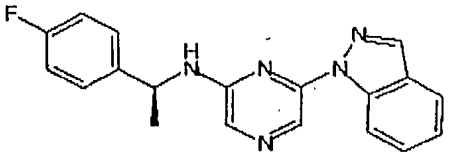


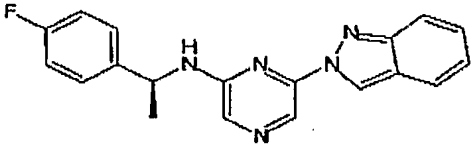


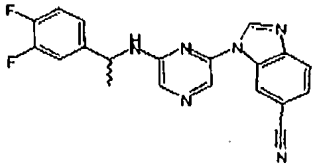


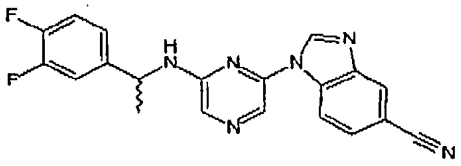


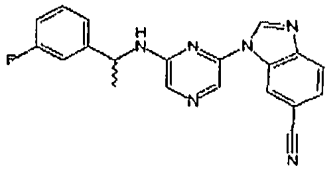


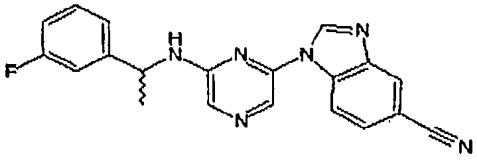


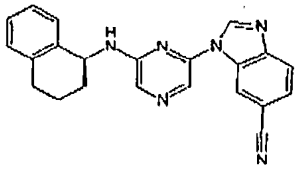


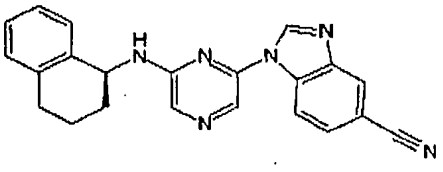


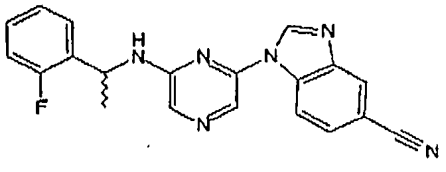


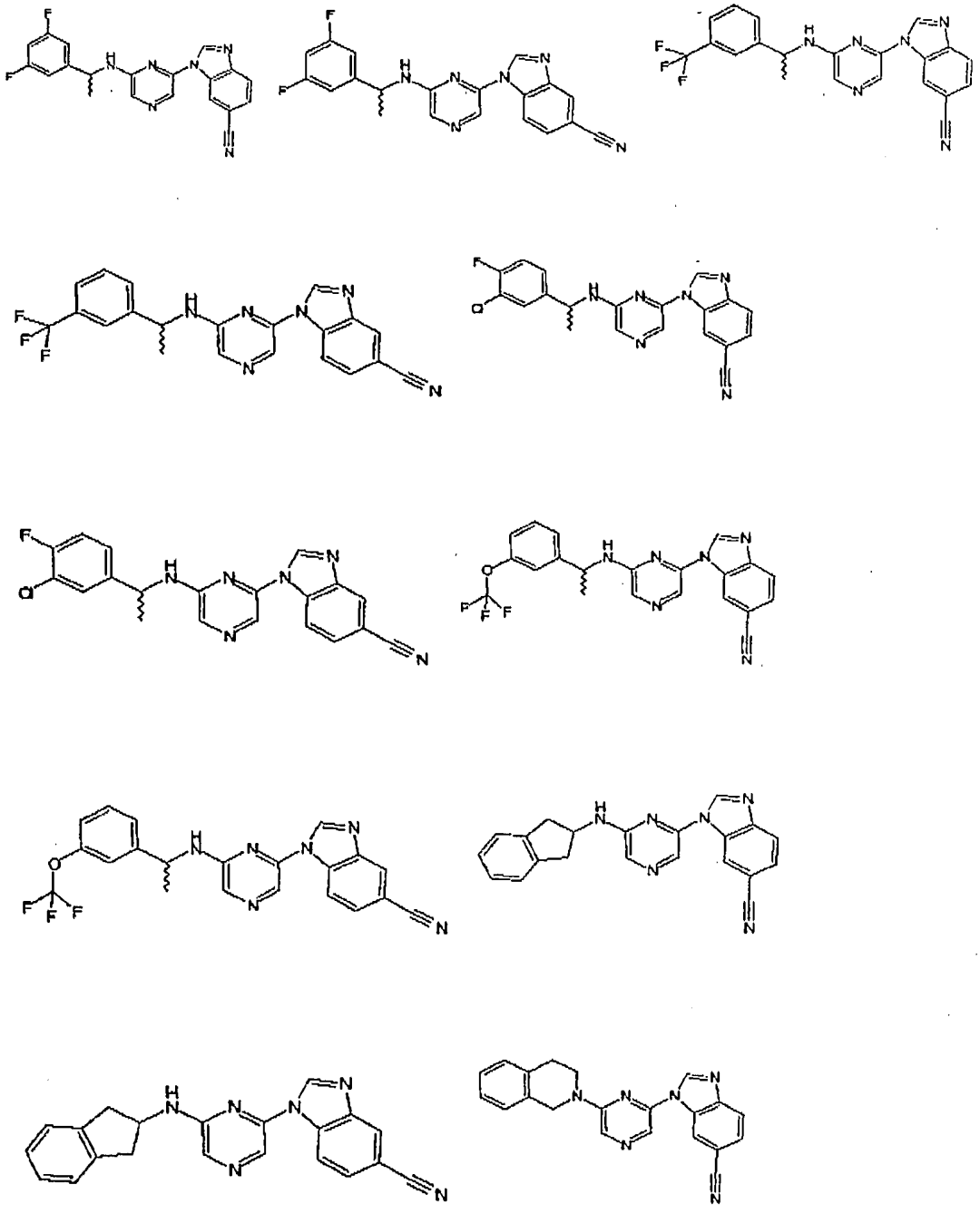


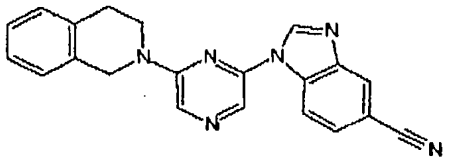


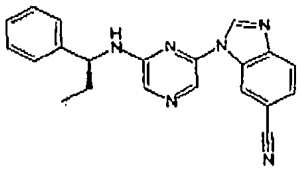


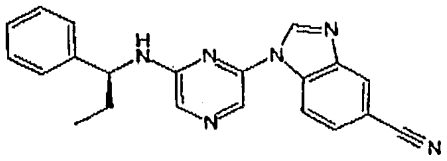


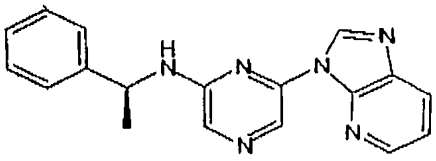


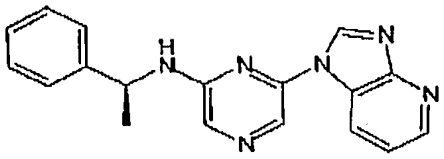


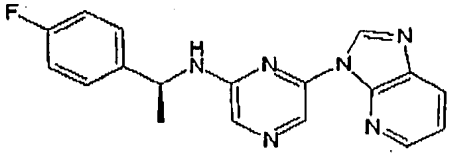


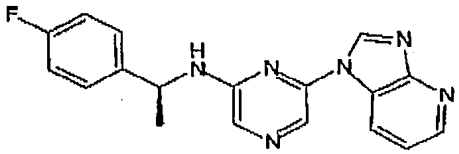


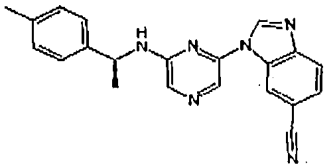


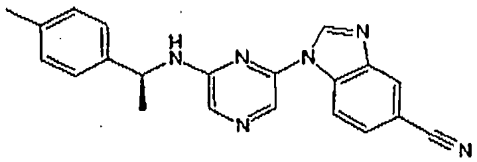


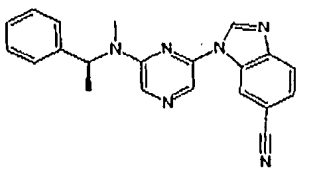


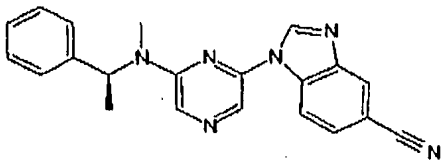


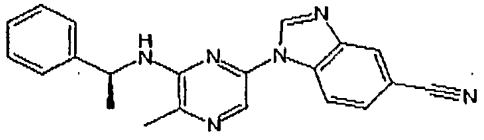


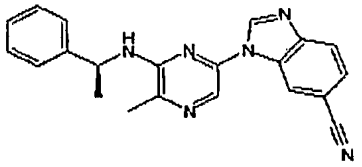


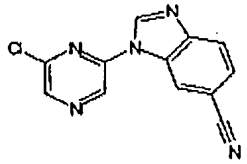


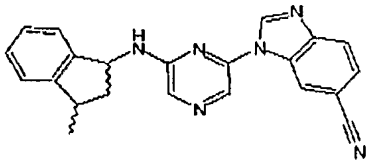


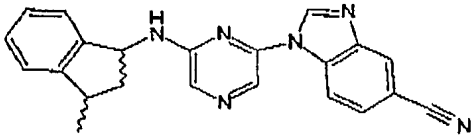


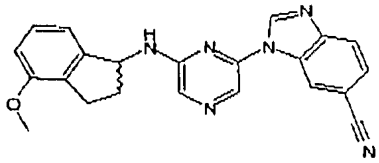


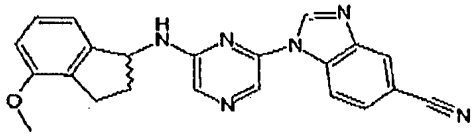


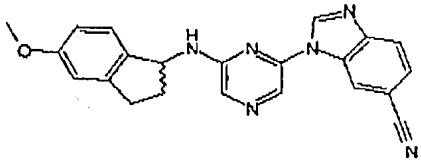


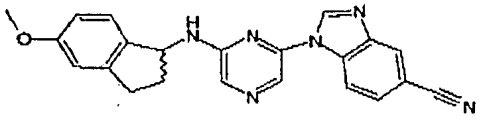


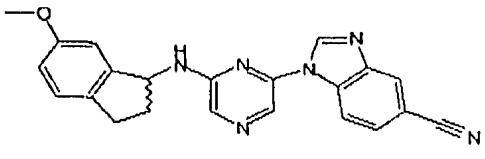


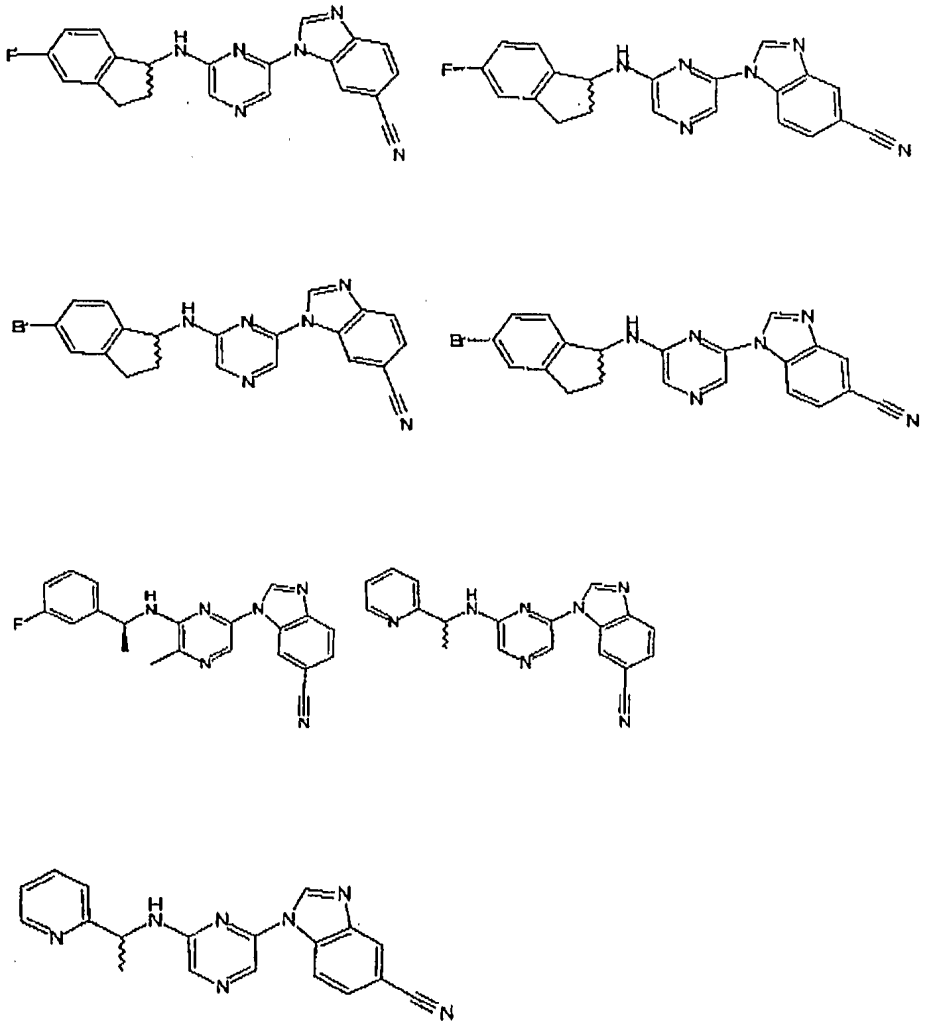








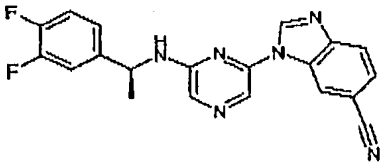




4. A compound according to formula (I) of claim 1 selected from the group consisting of 6-(1H-Benzimidazol-1-yl)-N-benzylpyrazin-2-amine,
6-(1H-Benzimidazol-1-yl)-N-[(1R)-1-phenylethyl]pyrazin-2-amine,
6-(1H-Benzimidazol-1-yl)-N-[(1S)-1-phenylethyl]pyrazin-2-amine, 1-(6-{[1-(3-Fluorophenyl)ethyl]amino}pyrazin-2-yl)-1H-benzimidazole-5-carboxamide, 1-(6-{[1-(3-Fluorophenyl)ethyl]amino}pyrazin-2-yl)-1H-benzimidazole-6-carboxamide, 1-(6-{[1-(3-Fluorophenyl)ethyl]amino}pyrazin-2-yl)-1H-benzimidazole-6-carbonitrile, 1-[6-(3,4-Dihydroisoquinolin-2(1H)-yl)pyrazin-2-yl]-1H-benzimidazole-5-carbonitrile, 1-[6-(3,4-

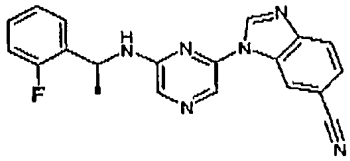
Dihydroisoquinolin-2(1H)-yl)pyrazin-2-yl]-1H-benzimidazole-6-carbonitrile, 1-{6-[(1S)-1,2,3,4-Tetrahydronaphthalen-1-ylamino]pyrazin-2-yl}-1H-benzimidazole-5-carbonitrile, 1-{6-[(1S)-1,2,3,4-Tetrahydronaphthalen-1-ylamino]pyrazin-2-yl}-1H-benzimidazole-6-carbonitrile, 1-(6-{[(1S)-1-Phenylethyl]amino}pyrazin-2-yl)-1H-benzimidazol-5-amine, 1-(6-{[(1S)-1-Phenylethyl]amino}pyrazin-2-yl)-1H-benzimidazol-6-amine, N-[1-(6-{[(1S)-1-Phenylethyl]amino}pyrazin-2-yl)-1H-benzimidazol-6-yl]-2,2-dimethylpropanamide, N-[1-(6-{[(1S)-1-Phenylethyl]amino}pyrazin-2-yl)-1H-benzimidazol-5-yl]acetamide, N-[1-(6-{[(1S)-1-Phenylethyl]amino}pyrazin-2-yl)-1H-benzimidazol-5-yl] methanesulfonamide, 2-(S-α-Methylbenzylamino)-6-(5-(N-methylpiperazin-4-yl-methyl)-benzimidazo-1-yl)-pyrazine, [1-(6-{[1-(4-Fluorophenyl)ethyl]amino}pyrazin-2-yl)-1H-benzimidazol-5-yl]methanol, [1-(6-{[1-(4-Fluorophenyl)ethyl]amino}pyrazin-2-yl)-1H-benzimidazol-6-yl]methanol and N-[1-(4-Fluorophenyl)ethyl]-6-{6-[(4-methylpiperazin-1-yl)methyl]-1H-benzimidazol-1-yl}pyrazin-2-amine.

5. The compound:



or a pharmaceutically acceptable prodrug, salt, hydrate, solvate, crystal form or diastereomer thereof.

6. The compound:



or a pharmaceutically acceptable prodrug, salt, hydrate, solvate, crystal form or diastereomer thereof.

7. A composition comprising a carrier and at least one compound according to any one of claims 1 to 6.

8. A method of treating a tyrosine kinase-associated disease state in a subject, the method comprising administering a therapeutically effective amount of a compound according to any one of claims 1 to 6 or a composition according to claim 7.

9. A method of treating a kinase-associated disease state according to claim 8, wherein the disease state involves JAK1, JAK2, JAK3 or TYK2.

10. A method according to claim 8 or 9 wherein the disease state is selected from the group consisting of Atopy, Cell Mediated Hypersensitivity, Rheumatic Diseases, Other autoimmune diseases, Viral Diseases, Cancer, Neurodegenerative Diseases, and Cardiovascular Diseases.

11. Use of a compound according to any one of claims 1 to 6 or a composition according to claim 7 for use in the preparation of medicaments for the treatment of JAK-associated disease states.

12. A method of treating diseases and conditions associated with inflammation and infection in a subject, the method comprising administering a therapeutically effective amount of at least one compound according to any one of claims 1 to 6 or a composition according to claim 7.